Image Data Processor and Image Recorder Incorporated with the Image Data Processor

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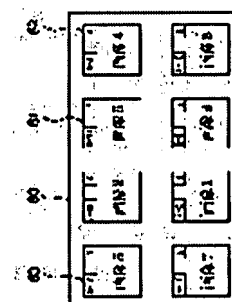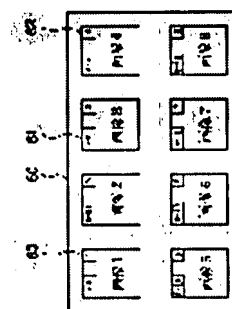| (51)Int.Cl. | H04N 5/76 |
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(54) IMAGE DATA PROCESSOR AND IMAGE RECORDER INCORPORATED WITH THE IMAGE DATA PROCESSOR

(57)Abstract:
PROBLEM TO BE SOLVED: To provide an image data
processor by which a user can simply seek a desired
picture in the case of index print, and to provide an
image recorder provided with the image data processor.
SOLUTION: This image data processor sorts picture files
in the order of data when reading picture data from a
storage medium. Then the image data processing unit is
provided with a means that can select the sorting
method of picture data in the sorted picture files in the
order of data even in the ascending order or descending
order. Since the image data processing unit can
designate the print order of the pictures independently of
the sorting direction, the image processing unit can
output a newest picture in a short time with a simple
operation and can reduce the time required for the picture selection.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Field of the Invention] This invention reads the digital image data stored in storages, such as memory card and a floppy (trademark) disk, sorts it in order of a request of the digital image data, and relates to the image data processor used in order to carry out the direct output of the digital image data after a sort to a printer, without minding personal KONHYUTA, and the image recording equipment having this image data processor.
[0002]
[Description of the Prior Art] In recent years, the image as a photography result is changed into digital image data, and the digital camera which stores this digital image data in storages, such as a flash memory, is spreading.
[0003] A personal computer is used for the image recording system for generally recording the image photoed with the digital camera by the printer, image data is incorporated from the storage with which digital image data was stored, a printer changes this image data into the print data in which record processing is possible, and a personal computer outputs it to a printer.
[0004] It explains concretely, referring to drawing 4 about this image recording system. Drawing 4 is drawing showing the conventional example of the image recording structure of a system.
[0005] As an image recording system is shown in drawing 4 , it consists of a digital camera 1501, a personal computer 1502, and a printer 1503, and a digital camera 1501 and a personal computer 1502 are connected possible [a communication link] through the telecommunication cables 1504, such as RS232C, and the personal computer 1502 and the printer 1503 are connected possible [a communication link] through the telecommunication cables 1505, such as Centronics.
[0006] The image photoed with the digital camera 1501 is temporarily stored in the flash memory with which the digital camera 1501 is equipped as digital image data. When recording this photoed image, first, a digital camera 1501 and a personal computer 1502 are connected with a telecommunication cable 1504, and communicating software is started on a personal computer 1502. Subsequently, a communication link is performed by this communicating software between the communicating software in a digital camera 1501, and the digital image data stored in the flash memory of a digital camera 1501 is transmitted to a personal computer 1502 through a telecommunication cable 1504. This transmitted digital image data is temporarily stored in the hard disk of a personal computer 1502 etc.
[0007] If the digital image data from a digital camera 1501 is incorporated by the personal computer 1502, the printer driver for printer 1503 is started on a personal computer 1502, and the digital image data incorporated by this printer driver from the digital camera 1501 will be outputted to a printer 1503 through a telecommunication cable 1505, after a printer 1503 is changed into the print data in which record processing is possible. A printer 1503 incorporates print data through a telecommunication cable 1505, and records and outputs the image which these print data show based on this print data to a record form.
[0008] However, since the actuation on the personal computers 1502, such as a startup of the printer

driver for changing and outputting connection of the telecommunication cable 1504 for incorporating the digital image data of a digital camera 1501 in a personal computer 1502, a startup of communicating software, and the incorporated digital image data to print data, and an activity were required of the above-mentioned conventional image recording system, the actuation for obtaining the image photoed with the digital camera took complicated time and effort, and it was troublesome.

[0009] Moreover, since cost is also high while the above image recording systems have a large scale, it is the factor made into what cannot use a digital camera for the user who does not own such a system easily.

[0010] Furthermore, although the spread of a personal computer is remarkable, actually mastering has many problems which should still be solved. There is also indication that those who cannot master even if had are a large majority. Even if it is going to purchase and install the application program for record processing and a printer driver for these persons to record the image as a photography result by the digital camera, the install itself is difficult or There is also a trouble that un-arranging [that the approach of command input is not known] may arise.

[0011] In order for a digital camera to spread from now on and to usually use it from such a background at ordinary homes, it is low cost, and the actuation at the time of carrying out record processing of the image as a photography result is easy, and an image data processor (henceforth an adapter) connectable with the printer by which processing actuation is start by electric power switch ON, or the image recording equipment which this image data processor united with the printer needs to be develop.

[0012] By the way, when the direct output of the digital image data stored in the storage is carried out to a printer using the above-mentioned adapter, When the above-mentioned adapter carries out a direct output using the printer by which internal organs are carried out, or to these equipments The usual printing mode which prints the image in one image file chosen from the image file groups which consist of two or more image files in one sheet of form, Since it has two printing modes of the index printing mode which follows two or more forms or one sheet of form, and prints the image in two or more continuous image files, a user can choose the desired mode according to an application. In addition, an index print is an image smaller than the image printed by the normal mode, for example, two or more images are printed on one sheet of form like drawing 5 . Moreover, an image file is a distinction opium poppy ****** thing about the image information (digital image data) memorized for every one photography. That is, the image information about one photography is memorized by one image file.

[0013] However, the user could not see the photoed image, and since it did not usually have the display screens, such as a liquid crystal panel for checking an image, the user was not able to choose a desired image file as the above-mentioned adapter immediately on that spot, and was not able to print the image on it. Conventionally, in order for a user to print a desired image, the image file number of an image to print needed to be checked on the screen of a digital camera, and it needed to be memorized. That is, in the screen of a digital camera, since the image file group which consists of two or more image files like drawing 6 was displayed, the user looked at this and was checking the image.

[0014] However, when a user wanted to print, a user always did not have to restrict digital one with pocket ****, but continuation printing of the image of an image file was carried out by the index printing mode, with the printed index print, in such a case, the image had to be checked and it had to choose the desired image after that. That is, the index printing mode was used as an image selection means for choosing an image.

[0015]
[Problem(s) to be Solved by the Invention] In the above-mentioned conventional example, it was outputting by the image file numerical order of the image file stored in the record medium at the time of continuation printing, i.e., an index print. In a digital camera, since the image data of a desired image file can be eliminated among two or more image files or the image data of the newly photoed image can be put in there, as shown in drawing 6 , an image is not necessarily located in a line in order of the date.

[0016] In such a case, the following problems occur. First, by the above-mentioned conventional approach, since the image is not located in a line in order of the date, there is [1st] a problem that the image ** wants to print a desired image on a ** case with an index print is not immediately caught in

the act of where being. People will be considered to be easy to look for a desired image, if things are memorized in many cases and the image is located in a line in order of the date with a certain degree degree day. An image to print on the 2nd is an image photoed on the same day in many cases, since what is necessary is just to carry out continuation assignment of the image number if the image is located in a line in order of the date in this case, it is easy but to specify a number, and since that number must be specified that an image is in a scattering location one by one, there is a problem that actuation of a user is complicated. Moreover, it is not so desirable when having stood in a line from the older one of the ascending order of the date, i.e., a date, even if the image is located in a line in order of the date. Because, an image to print immediately is usually newest image in many cases, and the newest image is located in the tail end, and it has the problem that time amount until it reaches the image of a request in the case of an index print will become long in the list direction of this date ascending order as the amount of image information stored in the storage increases.

[0017] This invention is made in view of the above-mentioned trouble, and aims at offering image recording equipment equipped with the image data processor and this image data processor which can look for a desired image easily in the case of an index print.

[0018] Moreover, this invention aims at offering image recording equipment equipped with the image data processor and this image data processor which can obtain two or more desired images, without carrying out complicated actuation.

[0019]
[Means for Solving the Problem] This invention for attaining the above-mentioned purpose reads said digital image data from the storage with which the digital image data photoed with the digital camera is stored. A sort means to be the image data processor which carries out the direct output of said digital image data to a printer, and to sort a distinction opium poppy ****** image file for said digital image data in order of the date, It is characterized by having the output means in which an output is possible by continuation also in the ascending order of the date, or descending order for the image data in said image file sorted in order of the date.

[0020] Moreover, a sort means for this invention to be image recording equipment equipped with the image data processor according to claim 1 to 6, and to sort a distinction opium poppy ****** image file for said digital image data in order of the date, The image data in said image file sorted in order of the date The output means in which the output by continuation is possible also in the ascending order of the date, or descending order, It is characterized by having a record means to record an image by giving ink to a record medium, based on the image data outputted by said output means.

[0021] In this invention, when performing continuation printing, the means which can choose the image sorted in order of the date also in ascending order or descending order is offered. Since it is not concerned towards a sort but the order of printing of an image can be specified by using this means, the image newest by easy actuation can be outputted in a short time, and it becomes possible to shorten the time amount concerning image selection.

[0022]
[Embodiment of the Invention] Hereafter, with reference to a drawing, the example of an operation gestalt of this invention is explained to a detail.

[0023] <Example 1 of an operation gestalt> Drawing 1 is the block diagram showing the configuration of the image data processor of this invention. Read-only memory ROM in which 101 stores procedure, printing modes, etc., such as an image processing and record processing, and 102 are the random access memory RAM used as the temporary storage field of digital image data, and an execution area of the above-mentioned processing. 103 is a storage connection for connecting storages, such as memory card which stores the image read with the photograph photoed with the digital camera, or the scanner as digital image data. 104 is CPU which reads the above-mentioned procedure and printing mode which are stored in ROM101, and performs processing of the above-mentioned image processing, record processing, etc. 105 is an interface for outputting the print data obtained after performing the above-mentioned processing to a printer. 106 is a bus for transmitting digital image data, and above-mentioned ROM101, RAM102, the storage connection 103, CPU104, and an interface 105 are mutually connected

through a bus. 200 is user I/F for specifying selection and printing mode of an image file. Thus, the image data processor 100 constituted is connected with a printer 107 through an interface 105. And the digital image data processed in the image data processor 100 is outputted to a printer as print data, and the record output of the image is carried out by the printer 107.

[0024] Drawing 2 is the outline perspective view showing the printer connected with the image data processor of this invention, and this image data processor. The image data processor 100 is connected with a printer 107 through an interface 105.

[0025] 200 is user I/F which receives actuation of a user, and a user performs selection of an image file, and assignment in printing mode by this. 103 is a storage connection which connects storages with which digital image data is stored as mentioned above, such as CompactFlash and a PCMCIA card. The storage connection 103 is for reading the digital image data stored in the storage, a storage is connected with the image data processor 100 by inserting a storage in the storage connection 103, and the image data processor 100 reads digital image data from the connected storage.

[0026] 107 is an example of an ink jet printer applicable to this invention. In addition, although the ink jet printer is used as a printer in this example of an operation gestalt, it cannot restrict to this but a thermal transfer printer (a dissolution mold, sublimation mold), a dot impact printer, a laser beam printer, an LED printer, etc. can apply all printers. The record medium 206 inserted in the feed location 211 of a printer 107 is conveyed with the delivery roller 209 to the recordable field of the recording head unit 203. A platen 208 is formed in the lower part of the record medium in a recordable field. Carriage 201 has movable composition in the direction defined with two guide shafts, the guide shaft 204 and the guide shaft 205, and carries out the both-way scan of the record section. The recording head unit 203 which contains in carriage 201 the ink tank which supplies the recording head which carries out the regurgitation of two or more color ink, and each recording head is carried. The ink of two or more colors prepared in the ink JIETSU recording apparatus of this example is four colors of black (Bk), cyanogen (C), a Magenta (M), and yellow (Y).

[0027] At the left end of the field where carriage is movable, the recovery system unit 210 is in the lower part, and it operates capping the delivery section of a recording head etc. at the time of un-recording. This left end is called the home position of a recording head.

[0028] 207 is the switch section and the display device section, the switch section is used at the time of ON/OFF of the power source of a recording device, or a setup of various recording modes etc., and the display device section carries out the role which displays the condition of a recording device.

[0029] Here, rearrangement of an image file which is the characteristic part of this invention is explained. If image data is read from a storage in the record-medium connection 103 of drawing 1 ; CPU104 gives the number which sorted the image file in which each read image data is stored in date ascending order inside, and continued to the rearranged image file (drawing 3). Drawing 3 is drawing having shown typically that the image file number which continued to the image file into which the image file stored in the storage was sorted by the date ascending order, and was rearranged within the image data processor was given.

[0030] It is displayed on user I/F200 as a result of [of image data] reading (for example, the number information on an image file stored). Through user I/F200, in order to choose a desired image, a user specifies an index printing mode and inputs the initiation number and termination number of an image file to print. At this time, when an initiation number is smaller than a termination number, an image to the image of a termination number of an initiation number carries out sequential continuation printing. As a result, an image is put in order and outputted to the date ascending order. Moreover, when an initiation number is larger than a termination number, the image outputted to the date descending order (new order of the date) by sequential continuation printing even of the image of a termination number being carried out from the image of an initiation number is obtained.

[0031] For example, when a user wants to print how many sheets of that image continuously from the newest image, it becomes possible to output simply the newest image and an image with near exposure time by setting the last image number obtained from number-of-sheets information as an initiation number, and setting the number of arbitration as a termination number.

[0032] Moreover, although an interface which sets up an initiation number and a termination number here was assumed, if the mode which outputs how many sheets of that image to descending order continuously from the newest image is formed, it is possible to be able to exclude a setup of an initiation number and to make actuation equivalent to the above only by performing a termination number or assignment of how many sheets go back perform.

[0033] In addition, above, although image data is sorted by the date ascending order, it is not restricted to this but may be sorted in date descending order.

[0034] As mentioned above, according to this example of an operation gestalt, since image data is sorted in order of the date, a user can get two or more desired images easily. Moreover, according to this example of an operation gestalt, even if it is the case where image data is sorted by the date ascending order, an image can be outputted by the method of assignment of a number in the direction which a user desires also in the date ascending order or date descending order. Moreover, the newest image can be outputted immediately, without spending many hours. Furthermore, since the image is located in a line in order of the date even if it is the case where he wants to print two or more images of the date on the same day, a user can get an image without complicated actuation that what is necessary is just to specify the image number corresponding to the date continuously.

[0035] <Example 2 of an operation gestalt> The example of an operation gestalt of this invention also uses the configuration of drawing 1 and drawing 2 . In this example of an operation gestalt, when the means which can choose only the newest image and the image of the same date as user I/F of 200 is established and a user chooses this, the function in which only the image which has the same date as the newest image in CPU of 104 is extracted, and continuation printing can be performed is offered. It enables this to simplify further the selection means of the image which the user meant. That is, according to this example of an operation gestalt, the image of the same date as the newest image can be outputted easily.

[0036] <Example 3 of an operation gestalt> The example 3 of an operation gestalt of this invention also uses the configuration of drawing 1 and drawing 2 . When the means which can choose only the image which exists in the same directory as the directory where the newest image is located in user I/F of 200 in this example of an operation gestalt is established and a user chooses this, the function in which only the image which exists in the same directory as the directory in which the newest image is located in CPU of 104 is extracted, and continuation printing can be performed is offered. Since possibility of being stored in the same directory is high, the image near the newest image becomes possible [that this simplifies further the selection means of the image which the user meant].

[0037] <Example 4 of an operation gestalt> The example 4 of an operation gestalt of this invention also uses the configuration of drawing 1 and drawing 2 . In this example of an operation gestalt, when the means which goes back to the part on several [past] from the date of the newest image, and can choose an image as user I/F of 200 is established and a user chooses this, the function in which only the image photoed from the date of the newest image in CPU of 104 by the part on several [past] is extracted, and continuation printing can be performed is offered. Since it is thought that the image for which a user asks has high possibility of existing near the newest image in a photography date, it enables this to simplify further the selection means of the image which the user meant.

[0038] <Example 5 of an operation gestalt> Although it was the configuration connected with a printer through an interface in the image data processor of the above-mentioned example of an operation gestalt, this invention is good also as a configuration which does not restrict to this but unifies the image data processor and printer of the above-mentioned example of an operation gestalt. That is, it considers as the image recording equipment having the above-mentioned image data processor.

[0039] The block diagram having shown the configuration of such image recording equipment in drawing 7 is shown. In addition, the same thing as drawing 1 attaches the same sign as the sign attached by drawing 1 . Here, the thing of the same sign as drawing 1 omits explanation. 1300 shows the whole image recording equipment and is equipped with the image recording means 1301. It will not be limited especially if it is the means which it is possible as an image recording means 1301 to use various methods, and can record an image on a record medium. As a recording method used as an image

recording means 1301, an ink jet recording method, an electrophotography method (a laser mold, LED mold), thermal recording (a dissolution mold, sublimation mold), etc. are applicable, for example. Drawing 8 is the outline perspective view showing the image recording equipment of this example of an operation gestalt. As mentioned above, for 103, as for user I/F and 203, a storage connection and 200 are [a recording head unit and 1300] the whole image recording equipment. Thus, by considering as the image recording equipment which unified the image data processor and the image recording means, it becomes unnecessary to install an image processing system and a printer separately, and space-saving-ization can be realized. Since the equipment started by unifying can be managed with one, actuation becomes easier and, moreover, leads also to power-saving.

[0040] Especially as a printer connectable with the image processing system of this invention, and image recording equipment of this invention, a flight-drop is formed also in an ink jet recording method using heat energy, the recording apparatus using the recording head of the ink jet method which records is desirable, and the effectiveness which was excellent in this recording apparatus is brought about.

[0041] About the typical configuration and typical principle, what is performed using the fundamental principle currently indicated by the U.S. Pat. No. 4723129 specification and the 4740796 specification, for example is desirable. Although this method is applicable to both the so-called mold on demand and a continuous system On the electric thermal-conversion object which is especially arranged corresponding to the sheet and liquid route where the liquid (ink) is held in the case of the mold on demand By impressing at least one driving signal which gives the rapid temperature rise which supports recording information and exceeds nucleate boiling Since make an electric thermal-conversion object generate heat energy, the heat operating surface of a recording head is made to produce film boiling and the air bubbles in the liquid (ink) corresponding to this driving signal can really be formed by 1 as a result, it is effective. A liquid (ink) is made to breathe out through opening for regurgitation by growth of these air bubbles, and contraction, and at least one drop is formed. If this driving signal is made into the shape of a pulse form, since growth contraction of air bubbles will be performed appropriately instancy, the regurgitation of a liquid (ink) excellent in especially responsibility can be attained, and it is more desirable. As a driving signal of the shape of this pulse form, what is indicated by the U.S. Pat. No. 4463359 specification and the 4345262 specification is suitable. In addition, if the conditions indicated by the U.S. Pat. No. 4313124 specification of invention about the rate of a temperature rise of the above-mentioned heat operating surface are adopted, further excellent record can be performed.

[0042] As a configuration of a recording head, the configuration using the U.S. Pat. No. 4558333 specification and U.S. Pat. No. 4459600 specification which indicate the configuration arranged to the field to which the heat operation section other than the combination configuration (a straight-line-like liquid flow channel or right-angle liquid flow channel) of a delivery which is indicated by each above-mentioned specification, a liquid route, and an electric thermal-conversion object is crooked is also included in this invention. In addition, the effectiveness of this invention is effective also as a configuration based on JP,59-138461,A which indicates the configuration whose puncturing which absorbs the pressure wave of JP,59-123670,A which indicates the configuration which uses a common slit as the discharge part of an electric thermal-conversion object to two or more electric thermal-conversion objects, or heat energy is made to correspond to a discharge part. Namely, no matter the gestalt of a recording head may be what thing, it is because it can record now efficiently certainly according to this invention.

[0043] Furthermore, this invention is effectively applicable also to the recording head of the full line type which has the die length corresponding to the maximum width of the record medium which can record a recording device. As such a recording head, any of the configuration which fills the die length with the combination of two or more recording heads, and the configuration as one recording head formed in one are sufficient.

[0044] In addition, this invention is effective also when the thing of a serial type like an upper example also uses the recording head fixed to the body of equipment, the recording head exchangeable chip type to which the electric connection with the body of equipment and supply of the ink from the body of equipment are attained by the body of equipment being equipped, or the recording head of the cartridge

type with which the ink tank was formed in the recording head itself in one.

[0045] Moreover, as a configuration of the recording device of this invention, since the effectiveness of this invention can be stabilized further, it is desirable to add the regurgitation recovery means of a recording head, a preliminary auxiliary means, etc. If these are mentioned concretely, a preheating means to heat using the capping means, the cleaning means, the pressurization or the suction means, the electric thermal-conversion object, the heating elements different from this, or such combination over a recording head, and an auxiliary discharge appearance means to perform the regurgitation different from record can be mentioned.

[0046] Moreover, corresponding to two or more ink which differs in a record color or concentration, it may be prepared the number of pieces of two or more pieces also about the class thru/or the number of a recording head carried. That is, although not only the recording mode of only mainstream colors, such as black, but a recording head may be constituted in one as a recording mode of a recording device or the paddle gap by two or more combination is sufficient, for example, this invention is very effective also in equipment equipped with at least one of each of the full color recording mode by the double color color of a different color, or color mixture.

[0047] Furthermore, in addition, in this invention example explained above, although ink is explained as a liquid It is ink solidified less than [a room temperature or it], and what is softened or liquefied at a room temperature may be used. Or by the ink jet method, since what carries out temperature control is common as a temperature control is performed for ink itself within the limits of 30 degrees C or more 70 degrees C or less and it is in the stabilization regurgitation range about the viscosity of ink, ink may use what makes the shape of liquid at the time of use record signal addition. In addition, in order to prevent the temperature up by heat energy positively because you make it use it as energy of the change of state from a solid condition to the liquid condition of ink, or in order to prevent evaporation of ink, the ink which solidifies in the state of neglect and is liquefied with heating may be used. Anyway, ink liquefies by grant according to the record signal of heat energy, and this invention can be applied also when using the ink of the property which will not be liquefied without grant of heat energy, such as that by which liquefied ink is breathed out, and a thing which it already begins to solidify when reaching a record medium. The ink in such a case is good for a porosity sheet crevice or a through tube which is indicated by JP,54-56847,A or JP,60-71260,A also as liquefied or a gestalt which counters to an electric thermal-conversion object in the condition of having been held as a solid. In this invention, the most effective thing performs the film-boiling method mentioned above to each ink mentioned above.

[0048]

[Effect of the Invention] Since according to this invention it is not concerned towards a sort but the order of printing of an image can be specified by having the means which can choose the image sorted in order of the date also in ascending order or descending order when performing continuation printing as explained above, the image newest by easy actuation can be outputted in a short time, and it becomes possible to shorten the time amount concerning image selection.

[0049] Moreover, according to the from book, it becomes possible to look for a desired image simply in the case of an index print.

[0050] Moreover, according to this invention, a user becomes possible [obtaining two or more desired images], without carrying out complicated actuation.

[Translation done.]